



STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. BOX 3378
HONOLULU, HAWAII 96801-3378

In reply, please refer to:
EMD / CWB

09042PKP04c

DATE: September 14, 2004
NPDES PERMIT NO.:HI 0021788

**RATIONALE: APPLICATION FOR NATIONAL POLLUTANT DISCHARGE
ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE TO
WATERS OF THE UNITED STATES**

FACILITY: HALEIWA WELLS GAC TREATMENT FACILITY

**PERMITTEE: CITY AND COUNTY OF HONOLULU
BOARD OF WATER SUPPLY**

FACILITY ADDRESS

Haleiwa, Oahu, Hawaii
TMK: 1-6-004-001:009

PERMITTEE MAILING ADDRESS

630 South Beretania Street
Honolulu, Hawaii 96843
Contact: Mr. Scot Muraoka
(808) 748-5942

PERMIT STATUS

The Department of Health (DOH) originally received the NPDES permit application on June 6, 2000. The DOH requested additional information in a letter, dated February 8, 2001, and the Permittee resubmitted the application on October 3, 2003. Additional information regarding the application was submitted on February 6, 2004.

The Director of Health (Director) proposes to issue a permit to discharge to the waters of the United States until five years from the date of issuance, and has included in the draft permit those terms and conditions which the Director has determined are necessary to carry out the provisions of the Federal Water Pollution Control Act (P.L. 92-500), Federal Clean Water Act of 1977 (P.L. 95-217) and Hawaii Revised Statutes Chapter 342D.

FACILITY OPERATION AND LOCATION

The City and County of Honolulu, Board of Water Supply ("Permittee"), proposes to discharge wastewater associated with the operation of four granular activated carbon (GAC) contactors at the Haleiwa Well GAC Treatment Facility ("facility") located in Haleiwa, Oahu, Hawaii. The facility will treat groundwater for the target contaminants dibromochloropropane (DBCP) and trichloropropane (TCP). The contactors will be capable of producing approximately 3.0 million gallons of potable water per day. The contactors can be operated as pairs in series with either contactor in the lead position or in single contactor configuration with the other contactor of the pair as a standby.

Discharges from the facility include dewatering and disinfection water associated with the removal of spent GAC; defining, backwash, forward flushing, and backwash tank rinse water associated with the preparation of new GAC beds; backwash and refreshing water associated with maintenance of the GAC beds; and pump blow-off water. All discharges will be discharged to the receiving water named Opaepa Stream, through Outfall Serial No. 001 at Latitude 21°34'58" N and Longitude 158°06'11" W.

RECEIVING WATER DESIGNATION

The receiving water, Opaepa Stream, is classified by the DOH as Class 2 Inland Waters under Hawaii Administrative Rules (HAR), Section 11-54-05. The objective of Class 2 waters is to protect their use for recreational purposes, the support and propagation of aquatic life, agricultural and industrial water supplies, shipping, and navigation.

DESCRIPTION OF THE DISCHARGE

A. Dewatering Effluent

When replacing the GAC in the contactor, the spent carbon slurry will be pumped from the contactor to a tanker truck. The slurry will be dewatered in the truck and the effluent stored in the backwash tank prior to discharge. The dewatering effluent may contain carbon particles and will be filtered prior to being discharged into the receiving water. This process will generate approximately 5000 gallons of dewatering effluent per contactor and will be discharged from the backwash tank at 600 gpm. This type of discharge is estimated to occur approximately 1-2 times a year for each contactor

B. Disinfection Water

After the GAC has been removed from the contactor, the contactor will be cleaned and disinfected using chlorinated well water. Prior to discharge, the disinfection water will be dechlorinated and filtered, but may contain carbon particles, and residual chlorine. This process will generate approximately 9,000 gallons of disinfection water per contactor and will be discharged from the backwash tank at 600 gpm. This type of discharge is estimated to occur approximately 1-2 times a year for each contactor.

C. Defining Water

The defining process removes the majority of the carbon fines in the new GAC bed and is performed in the backwash mode. Well water will be pumped through the GAC bed at a rate of 700 gpm to lift and fluidize the carbon to release the fines. The defining water generated from this process will have an elevated pH level and will contain carbon fines. The defining water will be filtered and its pH will be measured and neutralized prior to being discharged into the receiving water. This process will generate approximately 9,000 gallons of defining water per contactor and will be discharged from the backwash tank at 600 gpm. This type of discharge is estimated to occur approximately 1-2 times a year for each contactor.

D. Backwash Water (for Preparation of New GAC Bed)

After being defined, the new GAC bed will then be backwashed to remove the remaining carbon fines and to stratify the bed. The backwash water generated from this process will have an elevated pH level and will contain carbon fines. The backwash water will be filtered and its pH will be measured and neutralized prior to being discharged into the receiving water. This process will generate approximately 21,000 gallons of backwash water per contactor and will be discharged from the backwash tank at 600 gpm. This type of discharge is estimated to occur approximately 1-2 times a year for each contactor.

E. Backwash Tank Rinse Water

After the backwash procedure during the installation of new GAC beds, the backwash tank will be rinsed with potable water to remove any remaining carbon fines in the tank before receiving water from the forward flush procedure. The rinse water will be filtered prior to discharge into the receiving water. Approximately 3000 - 6000 gallons of rinse water is expected to be generated and the discharge is estimated to occur approximately 1-2 times a year for each contactor.

F. Forward Flush Water

After backwashing the new GAC bed, the bed will then be forward flushed to remove the remaining impurities. The discharge resulting from this process should be of drinking water quality and no treatment should be required unless testing prior to discharge indicated elevated pH and turbidity levels. This process will generate approximately 240,000 - 480,000 gallons of forward flush water per contactor and will be discharged from the backwash tank at 700 gpm. This type of discharge is estimated to occur approximately 1-2 times a year for each contactor.

G. Backwash Water (Maintenance of GAC Beds)

The GAC contactors will need to be routinely backwashed to remove accumulated suspended material and to expand the GAC beds. Backwashing should be performed four times a year for a duration of 15 minutes for each contactor. Desorption of DBCP and TCP from the GAC into the backwash water is not anticipated and therefore these pollutants should not be present in the discharge. The backwash water will be filtered to ensure that contaminated carbon particles and suspended solids that may be present in the backwash water will not be discharged into the receiving water. This process will generate approximately 10,500 gallons of defining water per contactor and will be discharged from the backwash tank at 600 gpm.

H. Refreshing Water

The GAC beds in stand-by contactors must be refreshed monthly for a duration of six hours to prevent stagnation. Well water will be applied at a rate of 700 gpm. The refreshing water will be of drinking water quality and no treatment should be required unless testing prior to discharge indicates elevated pH and turbidity levels. This process will generate approximately 42,000 gallons of refreshing water per contactor and will be discharged through the backwash tank's overflow line at a rate of 700 gpm.

I. Pump Blow-Off Water

Standing water in shafts not in operation will be pumped out of the shaft for three minutes and discharged to the receiving water through the blow-off discharge line. This process will generate approximately 2,100 gallons per blow-off at 700 gpm. This type of discharge is estimated to occur three times a day.

The following table includes information submitted with the NPDES permit application. Values were determined based on best professional estimates.

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PARAMETER	ESTIMATED MAXIMUM DAILY CONCENTRATIONS (in mg/l unless otherwise indicated)								
	REMOVAL OF SPENT CARBON		PREPARATION OF NEW GAC BED				MAINTENANCE		PUMP BLOW-OFF
	DEWATERING	DISINFECTION	DEFINING	BACKWASH	FORWARD FLUSH	BACKWASH TANK RINSE WATER	BACKWASH	REFRESHING	
Flow (gpm)	600	600	600	600	700	600	600	700	700
Quantity/Contactor (gallons)	5,000	8,200	9,000	21,000	480,000	6,000	10,500	42,000	2,100
Total Suspended Solids	15.0	15.0	15.0	15.0	5.0	15.0	15.0	NE	10.0
Temperature - Winter (°C)	20	20	20	20	20	20	20	20	20
Temperature - Summer (°C)	23	23	23	23	23	23	23	23	23
pH (Standard Units)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Dibromochloro- propane (ppb)	ND	ND	ND	ND	ND	ND	ND	ND	0.03 ppb
Trichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	0.60 ppb
Total Residual Chlorine	NE	19.0	NE	NE	NE	NE	NE	NE	NE
Nitrate + Nitrite Nitrogen	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Total Phosphorus	0.30	0.30	0.69	0.69	0.69	0.69	0.30	0.30	0.30
Total Barium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Iron	<0.01	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.01	<0.01
Total Manganese	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Lead	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Arsenic	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Copper	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

NE Not Expected
ND Not Detected

PROPOSED DETERMINATIONS

The proposed effluent limitations and monitoring requirements specified in Part A of the draft permit are based on HAR Chapter 11-54, Water Quality Standards and best professional judgement.

A. Discharge Limitations and Monitoring Requirements

1. Backwash Tank Discharges

The backwash tank discharges (defined as dewatering, and disinfection water associated with the removal of spent GAC; defining, backwash, rinsing, and forward flushing water associated with the preparation of new GAC beds; backwash and refreshing water associated with maintenance of the GAC beds) shall be monitored for total suspended solids, turbidity, and pH. The discharge limitations for these parameters are based on HAR, Section 11-54-05.2(b), specific criteria for streams. No toxic parameters are expected to be present in the discharge. The effluent discharged through the backwash tank receives treatment (contacts the GAC beds) and should not contain DBCP nor TCP.

2. Disinfection Water Discharges

The disinfection water discharges shall be monitored for total suspended solids, turbidity, pH, and total residual chlorine. The discharge limitations for total residual chlorine is based on HAR, Section 11-54-04, Basic Water Criteria. The limitations for the other parameters are based on HAR, Section 11-54-05.2(b), specific criteria for streams. The disinfection water should not contain DBCP nor TCP.

3. Pump Blow-Off Water Discharges

The pump blow-off water discharges shall be monitored for total suspended solids, turbidity, pH, DBCP, and TCP. The discharge limitations for total suspended solids, turbidity, and pH are based on HAR, Section 11-54-05.2(b), specific criteria for streams. There are no discharge limitations for DBCP and TCP specified in the draft permit because there are no water quality standards for these parameters. However, the Permittee shall be required to perform acute whole effluent toxicity testing on the pump blow-off water to determine if the discharge may have any toxic effects on the receiving waters.

B. Whole Effluent Toxicity Requirements

The proposed whole effluent toxicity limitation and monitoring requirements are incorporated into Parts A and B of the draft permit in accordance with the 40 CFR Section 122.44(d) as published in the Federal Register on June 2, 1989. The whole effluent

limitation enforces basic provisions of HAR, Section 11-54-04 and are listed in Section 1 of the Standard NPDES Permit Conditions.

The draft permit requires the Permittee to conduct either acute or chronic whole effluent toxicity testing on pump blow-off water because of the presence DBCP and TCP. The proposed acute toxicity limitation of 80% survival in 100% effluent is pursuant to HAR, Section 11-54-04(b)(4)(B). The proposed chronic toxicity limitation is no observable effects in 100% effluent.